

**Listing of claims:**

The following is a complete listing of all claims in the application, with an indication of the status of each:

- 1 1. (Currently Amended) A method to diagnose equipment failures using an  
2 integrated approach of case-based reasoning and reliability analysis,  
3 comprising the steps of:
  - 4 collecting a statistical reliability data for each of a plurality of given  
5 equipments and for each of the hardware components of said equipment,  
6 said collecting including calculating a statistical average time between two  
7 successive failures of the equipment, calculating a statistical average time  
8 between successive two failures for each of said hardware components,  
9 calculating a statistical average time to repair failures of the equipment and  
10 calculating a statistical average time to repair failures of each of its hardware  
11 components;  - 12 constructing ~~maintaining~~ a case base database for each of the  
13 equipment, wherein each case based database record comprises at least four  
14 fields, including a failed equipment identifier field, a failed component  
15 identifier field, a failure description text field, and a solution record field;  - 16 receiving an equipment problem description from a user, said  
17 description including a problem equipment identifier and a problem  
18 description text;  - 19 generating for each of said hardware components a conditional  
20 statistical probability of said component having a failed state given that the  
21 equipment identified by the user-input problem equipment identifier has a  
22 failed state, based on said collected statistical reliability data;  - 23 for each component in the equipment, calculating failure probability  
24 based on at least one of historical failure data and published failure data of  
25 the components;

26 matching the problem description test input by the user to the failure  
27 description text field of the case base database records to calculate for each  
28 component, calculating a case-based probability of for each of said hardware  
29 components associated with said failed state matching problem description  
30 assuming that a component fails, using case based reasoning;  
31 for each component, combining the calculated probabilities to compute  
32 an overall failure probability given historical failure published failure data, and  
33 said problem description; and  
34 generating composing a list of component troubleshooting  
35 recommendations based on said generated conditional statistical probabilities  
36 and said calculated case base probabilities; and ranked by overall failure  
37 probabilities computed for each component and retrieving corresponding past  
38 solutions from said case base database  
39 displaying said list of generated troubleshooting recommendations.

2 -5 (Canceled).

1 6 (Currently Amended). A decision support system to diagnose equipment  
2 failures using an integrated approach of case-based reasoning and reliability  
3 analysis, comprising:  
4 a statistical reliability database storing a statistical reliability data  
5 representing, for each of a plurality of given equipments and for each of the  
6 hardware components of said equipment, a statistical average time between  
7 two successive failures of the equipment, the statistical average time between  
8 two successive failures for each of its hardware components, the statistical  
9 average time to repair failures of the equipment and the statistical average  
10 time to repair failures of each of its hardware components;  
11 a case base maintenance management system database for the  
12 equipment wherein each case base database record comprises at least four

13 fields, including a failed equipment identifier field, a failed component  
14 identifier field, a failure description text field, and a solution record field;  
15 a decision support system database;  
16 a decision support system client for receiving an equipment problem  
17 description from a user, said description including a problem equipment  
18 identifier and a problem description text;  
19 a decision support system server receiving input from the decision  
20 support system client and accessing said case base maintenance  
21 management system database and said decision support system database,  
22 said decision support system server including  
23 a real-time decision support system engine for calculating failure  
24 probability for each hardware component in the equipment, wherein said  
25 engine is  
26 arranged to receive an equipment problem description from a  
27 user, said description including a problem equipment identifier data  
28 and a problem description text;  
29 arranged to generate, for each of said hardware components a  
30 conditional statistical probability of said component having a failed  
31 state given that the equipment identified by the user-input problem  
32 equipment identifier has a failed state, based on said collected  
33 statistical reliability data;  
34 arranged to match the problem description test input by the user  
35 to the failure description text field of the case base database records to  
36 calculate a case-based probability for each of said hardware  
37 components associated with said failed state;  
38 arranged to generate a list of component troubleshooting  
39 recommendations based on said generated conditional statistical  
40 probabilities and said calculated case base probabilities,  
41 ~~at least one of historical failure data and published failure data of each~~  
42 ~~of the components, and for calculating a probability of matching said~~

43 ~~equipment problem description for each component, assuming that a~~  
44 ~~component fails, using case based reasoning, and for each component,~~  
45 ~~combining said calculated probability of matching said equipment problem~~  
46 ~~description for each component to compute an overall failure probability for~~  
47 ~~each component given said at least one of the historical failure data and~~  
48 ~~published failure data of each of the components and said equipment problem~~  
49 ~~description and~~

50 arranged to display said ~~composing~~ a list of component  
51 troubleshooting recommendations ranked by overall failure said  
52 generated conditional statistical probabilities and said calculated  
53 case base probabilities computed for each hardware component, and  
54 to retrieve ~~retrieving~~ corresponding past solutions from the case  
55 base maintenance management system database; and  
56 a case base update processor for copying closed failure transaction  
57 records from the case base maintenance management systems database,  
58 and extracting information from these transaction records to obtain attributes  
59 required by said real-time decision support system engine, and indexing each  
60 closed failure transaction record by a failed component identification and a  
61 number of occurrence of failure of that particular component.

7-10. (Canceled)